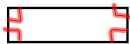
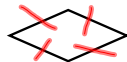


8-4 Properties of Rectangles, Rhombuses and Squares

Rectangle--parallelogram with 4 right angles



Rhombus--parallelogram with 4 congruent sides



Square--parallelogram with 4 right angles and 4 congruent sides

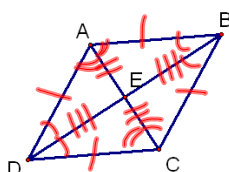


Corollaries

Rhombus Corollary--A quadrilateral is a rhombus iff it has 4 congruent sides.

Rectangle Corollary--A quadrilateral is a rectangle iff it has 4 right angles.

Square Corollary--A quadrilateral is a square iff it is a rhombus and a rectangle.



Rhombus ABCD

Prove: $\overline{AC} \perp \overline{DB}$

S.	R.
①	① Given
② $\overline{AB} \cong \overline{BC}$	② def of Rhombus
③ \overline{BE} is \perp bis. of \overline{AC}	③ Conv. \perp bis thm
④ $\overline{AC} \perp \overline{DB}$	④ def of \perp bis

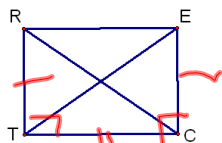
Theorem 8.11--A parallelogram is a rhombus iff its diagonals are perpendicular

Theorem 8.12--A parallelogram is a rhombus iff each diagonal of a rhombus bisects a pair of opposite angles



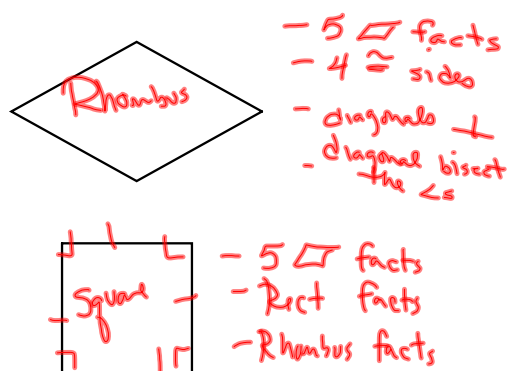
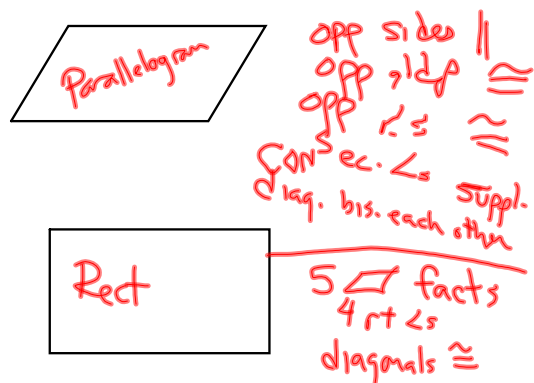
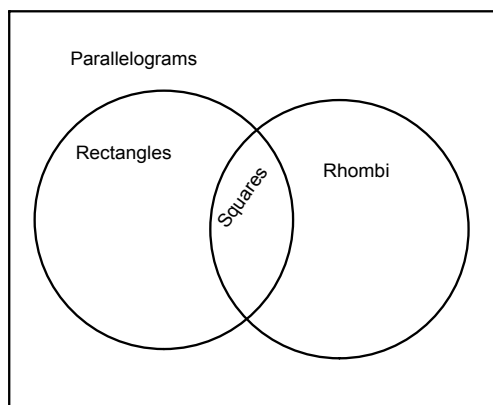
Given: Rectangle RECT

Prove: $\overline{RC} \cong \overline{TE}$



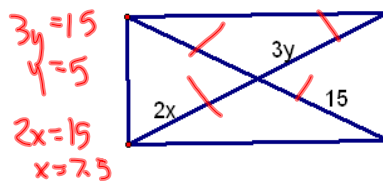
S.	R.
①	① Given
② $\angle RTC \cong \angle ECT$ as rt \angle s	② def of Rect.
③ $\angle RTC \cong \angle ECT$	③ Rt \angle s \cong
④ $\overline{RT} \cong \overline{EC}$	④ Opp sides of \square are \cong
⑤ $\overline{TC} \cong \overline{TE}$	⑤ Reflexivity
⑥ $\triangle RTC \cong \triangle ECT$	⑥ SAS
⑦ $\overline{RC} \cong \overline{TE}$	⑦ CPCTC

Theorem 8.13--A parallelogram is a rectangle iff its diagonals are congruent.

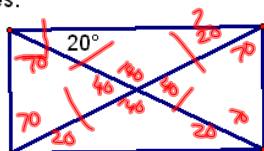


Examples:

Given the rectangle below, solve for x and y.



Given the rectangle below, fill in all of the angles.



Is ABCD a rectangle?

A(-2, 1)

B(4, 3)

C(5, 0)

D(-1, -2)

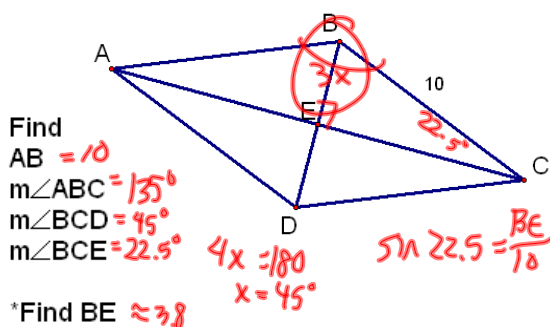
$$\overline{AB} \quad m = \frac{3-1}{4-(-2)} = \frac{1}{3} \quad \overline{AD} \quad m = \frac{-2-1}{-1-(-2)} = \frac{-3}{1} = -3$$

$$\overline{DC} \quad m = \frac{0-(-2)}{5-(-1)} = \frac{2}{6} = \frac{1}{3} \quad \overline{BC} \quad m = \frac{3-0}{4-5} = \frac{3}{-1} = -3$$

ABCD is a \square b/c opp sides are \parallel . \therefore ABCD is a rectangle b/c consecutive sides are \perp .

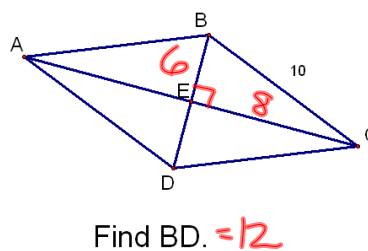
Rhombus ABCD

$$m\angle ABC = 3m\angle BCD$$



Rhombus ABCD

$$AC = 16$$



Is $\square ABCD$ a rectangle, rhombus, or a square. List all that apply.

1. A(-7, 3) B(-2, 3) C(1, 7) D(-4, 7)

If diag \cong , then rect.
 If diag \perp , then rhombus.
 If both, square

$$\overline{AC} \quad m = \frac{7-3}{1-(-7)} = \frac{4}{8} = \frac{1}{2} \quad \overline{BD} \quad m = \frac{7-3}{-4-(-2)} = \frac{4}{-2} = -2$$

$$AC = \sqrt{8^2 + 4^2} = \sqrt{80} \quad BD = \sqrt{(-2)^2 + 4^2} = \sqrt{20}$$

Is $\square ABCD$ a rectangle, rhombus, or a square. List all that apply.

2. A(-2, -1) B(-4, 3) C(1, 5) D(3, 1)

HW

p537-538

#s 1-14, 19-24, 32-49

50 & 51 (don't find perimeter)

This is not as much as it seems.